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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/522,294 03/09/00 KATO

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EXAMINER

PHAM, H

ART UNIT

PAPER NUMBER

2861

DATE MAILED:

04/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/522,294

Applicant(s)

KATO, MANABU

Examiner

Hai C Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2000 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the *detection optical element and the second lens for focussing being integrally formed*, must be shown or the feature canceled from the claims 10, 28, and 38. No new matter should be entered.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 250 words. It is important that the abstract not exceed 250 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means," "said," and "comprise," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Art Unit: 2861

4. The abstract of the disclosure is objected to because it contains terms that should be avoided, i.e., "comprises" and "comprising" at lines 1, and 19, respectively.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1:

- The following limitation "*the* timing of *the* start of scanning" at line 11 lacks antecedent basis.

Claim 12:

- The following limitation "*the* timing of *the* start of scanning" at line 11 lacks antecedent basis.

Claim 19:

- The following limitation "*the* timing of *the* start of scanning" at line 7 lacks antecedent basis.

Claim 30:

- The following limitation "*the* timing of *the* start of scanning" at line 7 lacks antecedent basis.

Claims 2-11, 13-18, 20-29, and 31-39 are dependent from claims 1, 12, 19, and 30 above, respectively, and are therefore indefinite.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Budd et al. (U.S. 4,950,889.)

Budd et al. discloses a multiple beam scanning device comprising a light source (laser array module 24, Fig. 2) having a plurality of light beam emitting sections (emitting four nearly coaxial laser beams 20-23,) a light deflector (polygon mirror) for deflecting a plurality of light beams emitted respectively from said plurality of light beam emitting sections, a scanning optical system (imaging lenses 27-29) for focussing said plurality of light beams deflected by said light deflector on a surface to be scanned (surface of the photoreceptor 10,) a photodetector (35) for controlling the timing of the start of scanning of said plurality of light beams by detecting a part of at least one of said plurality of light beams deflected by said light deflector as detection light beam (using one of the plurality of light beams as a reference beam for producing a reference beam start of scan) (col. 2, lines 58-64,) said timing of the start of scanning being so

controlled as to make the centers of the scanning areas of said light beams agree with each other on the surface to be scanned when said plurality of light beams have respective wavelengths that are different from each other (col. 6, lines 3-59, and col. 8, lines 26-53.)

With regard to claim 11, Budd et al. further discloses the photodetector detecting part of each of the plurality of light beams deflected by the light deflector (col. 7, lines 4-17.)

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2, 4, 8, 9, 12, 14, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. in view of Kanoto et al. (U.S. 5,365,259.)

Budd et al. discloses all the basic limitations of the claimed invention except for a detection optical element for converging the deflected light beam toward the photodetector, being arranged orthogonally relative to the detection light beam (claim 2,) and the detection optical element being made of plastic material (claim 4.)

However, Kanoto et al. discloses a scanning optical device comprising a detection optical element (21c, Fig. 2) for converging the deflected laser beam toward

Art Unit: 2861

the start of scan photosensor (11,) the detection lens being disposed orthogonally relative to the deflected laser beam, and being made of plastic material.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Budd et al. to include a plastic focussing lens used with the photodetector as taught by Kanoto et al. Doing so would allow the deflected light beam to converge and focus on the detecting area of the photodetector.

With regard to claims 8 and 9, Budd et al. also discloses an incident optical system, which comprises a first lens (collimating optics 33) for collimating each of the plurality of light beams and a second lens (cylindrical lens 25) for focussing the collimated light beams on the facet (26) of the polygon mirror as a linear image extending in the main scanning direction.

11. Claims 3, 10, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. in view of Kanoto et al., as applied to claims 1 and 2 above, and further in view of Kato (U.S. 5,963,356.)

Budd et al., as modified by Kanoto et al., discloses all the basic limitations of the claimed invention except for the detection optical element for converging the deflected light beam toward the photodetector being an anamorphic lens (claim 3,) and the detection optical element being integrally formed with the condenser lens used as a second lens in the incident optical system (claim 10.)

However, Kato, an acknowledged prior art, discloses an anamorphic detection optical element (BD lens 42, Fig. 2) for converging the deflected laser beam toward the BD sensor (9,) the BD lens being disposed orthogonally relative to the deflected laser beam, and being integrally formed with the cylindrical lens (41,) which is a second lens used to focus the laser beam emitted by the laser source (1) onto the surface of the polygon mirror (5.)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Budd et al., as modified by Kanoto et al., with the aforementioned teaching of Kato. Doing so would allow a compact configuration to be designed for the entire optical scanning device while maintaining a high accuracy optical scanning performance.

12. Claims 5-7, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. in view of Kanoto et al., as applied to claims 1 and 2 above, and further in view of Kamikubo (U.S. 6,124,962.)

Budd et al., as modified by Kanoto et al., with Kanoto et al. further teaching the detection optical element (21c) being integrally formed with the scanning lens (21b,) both of which are made of plastic material, fails to disclose the scanning optical system comprising of a refraction optical element and a diffraction optical element.

However, Kamikubo discloses a scanning optical system whose scanning lenses comprise refraction lens elements with a diffraction lens structure for compensating

compensates for the lateral chromatic aberration caused by the refraction lens elements.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the scanning device of Budd et al., as modified by Kanoto et al., by incorporating the refraction and diffraction lens elements as taught by Kamikubo et al. Doing so would eliminate the chromatic aberration when a light source emitting a plurality of light beams of different wavelengths are used.

13. Claims 19, 29, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. in view of Applicant's acknowledged prior art (AAPA's).

Budd et al. discloses all the basic limitations of the claimed invention except for the image forming apparatus being configured to have a plurality of scanning optical apparatus with respective image carriers.

However, Applicant's own acknowledged prior art discloses a conventional printing apparatus (Fig. 2) as a tandem type color image forming apparatus having a plurality of optical scanning apparatuses with a same number of image carriers, which would realize high speed color image formation. Furthermore, with regard to claims 29 and 39, it is well known in the art as an inherent fact that the laser beams in a tandem type color image forming apparatus are modulated independently relative to each other.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Budd et al. with the

Art Unit: 2861

aforementioned disclosure of AAPA's since such tandem type of color image forming apparatus is well known in the art.

14. Claims 20, 22, 26, 27, 30, 32, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. in view of AAPA's, as applied to claim 19 above, and further in view of Kanoto et al. (U.S. 5,365,259.)

Budd et al. discloses all the basic limitations of the claimed invention except for a detection optical element for converging the deflected light beam toward the photodetector, being arranged orthogonally relative to the detection light beam (claim 20,) and the detection optical element being made of plastic material (claim 22.)

However, Kanoto et al. discloses a scanning optical device comprising a detection optical element (21c, Fig. 2) for converging the deflected laser beam toward the start of scan photosensor (11,) the detection lens being disposed orthogonally relative to the deflected laser beam, and being made of plastic material.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Budd et al. to include a plastic focussing lens used with the photodetector as taught by Kanoto et al. Doing so would allow the deflected light beam to converge and focus on the detecting area of the photodetector.

With regard to claims 8 and 9, Budd et al. also discloses an incident optical system, which comprises a first lens (collimating optics 33) for collimating each of the plurality of light beams and a second lens (cylindrical lens 25) for focussing the

collimated light beams on the facet (26) of the polygon mirror as a linear image extending in the main scanning direction.

15. Claims 21, 28, 31, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. in view of Kanoto et al., as applied to claims 1 and 2 above, and further in view of Kato (U.S. 5,963,356.)

Budd et al., as modified by Kanoto et al., discloses all the basic limitations of the claimed invention except for the detection optical element for converging the deflected light beam toward the photodetector being an anamorphic lens, and the detection optical element being integrally formed with the condenser lens used as a second lens in the incident optical system.

However, Kato, an acknowledged prior art, discloses an anamorphic detection optical element (BD lens 42, Fig. 2) for converging the deflected laser beam toward the BD sensor (9,) the BD lens being disposed orthogonally relative to the deflected laser beam, and being integrally formed with the cylindrical lens (41,) which is a second lens used to focus the laser beam emitted by the laser source (1) onto the surface of the polygon mirror (5.)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Budd et al., as modified by Kanoto et al., with the aforementioned teaching of Kato. Doing so would allow a compact configuration to be designed for the entire optical scanning device while maintaining a high accuracy optical scanning performance.

16. Claims 23-25, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. in view of Kanoto et al., as applied to claims 1 and 2 above, and further in view of Kamikubo (U.S. 6,124,962.)

Budd et al., as modified by Kanoto et al., with Kanoto et al. further teaching the detection optical element (21c) being integrally formed with the scanning lens (21b,) both of which are made of plastic material, fails to disclose the scanning optical system comprising of a refraction optical element and a diffraction optical element.

However, Kamikubo discloses a scanning optical system whose scanning lenses comprise refraction lens elements with a diffraction lens structure for compensating compensates for the lateral chromatic aberration caused by the refraction lens elements.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the scanning device of Budd et al., as modified by Kanoto et al., by incorporating the refraction and diffraction lens elements as taught by Kamikubo et al. Doing so would eliminate the chromatic aberration when a light source emitting a plurality of light beams of different wavelengths are used.

Contact Information

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Uzuki (U.S. 5,952,650) discloses a scanning optical device in which the BD focusing lens (16) and the cylindrical lens (15) are integrally formed.

Art Unit: 2861

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (703) 308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in cursive script, appearing to read 'Hai C Pham'.

hcp
April 21, 2001